CLAIMS

What is claimed is:

1. A cheese block former comprising:

a tower section with an inner surface and an outer surface, the inner surface defining an interior area, the tower section further having a curd feed inlet to supply curd into the interior area of the tower section to form a column of cheese as the column of cheese is transported downwardly within the interior area and out a lower end of the tower section; and

a finishing station coupled to the tower section, the station comprising:

a housing;

a platform disposed within the housing, the platform to receive the column of cheese thereon and the platform moveable so as to position the column of cheese at a predetermined height;

a rotary-to-linear actuator connected to the platform to actuate movement of the platform; and

a cutting member connected to the housing to portion the column of cheese at the predetermined height into a cheese column portion.

2. The cheese block former of Claim 1 wherein the rotary-to-linear actuator comprises a rack portion that is in meshing engagement with a pinion portion.

3. The cheese block former of Claim 2 wherein the rack portion comprises a characteristic rack height that corresponds to a desired weight of the cheese column portion.

4. The cheese block former of Claim 2 further comprising a motor and a gearbox, the motor and gearbox fixedly connected to the finishing station, to drive the pinion portion that is in meshing engagement with the rack portion.

5. The cheese block former of Claim 2 wherein the rotary-to-linear actuator comprises one of a ballscrew and a jackscrew.

6. The cheese block former of Claim 4 further comprising a gearbox that is in operative association with the motor.

7. The cheese block former of Claim 4 wherein the motor is a three-phase, 1 horsepower motor.

8. A cheese block former for continuously making large blocks of bulk cheese from a cheese curd mixture, the cheese block former comprising:

a tower section with a top end and a bottom end, an outer surface and an inner surface, and an interior area, the tower section further having a curd feed inlet to provide curd to the interior area;

a cutting member having a moveable blade member positioned at the bottom end of the tower section, the cutting member operable between a first position in which the blade closes the bottom end of the tower section and an open position in which the blade is withdrawn from the bottom end of the tower section; and

a finishing station coupled to the tower section, the station comprising:

a rotary-to-linear actuator;

a cutting member; and

a platform connected to the rotary-to-linear actuator, the platform structured to receive the column of cheese thereon, and the platform moveable so as to position the column of cheese at a predetermined height relative to the blade of the cutting member.

9. The cheese block former of Claim 8 wherein the rotary-to-linear actuator comprises a rack portion that is in meshing engagement with a pinion portion.

10. The cheese block former of Claim 8 wherein the rack portion comprises a characteristic height that corresponds to a desired weight of the cheese column portion

11. The cheese block former of Claim 9 wherein the rotary-to-linear actuator comprises a ballscrew.

12. A cheese block portioning station comprising:

a rotary-to-linear actuator;

a platform connected to the rotary-to-linear actuator, the platform for receiving a cheese column thereon, and the platform moveable to position the column of cheese at a predetermined height; and

a cutting member to portion the column of cheese at the predetermined height.

13. The cheese block portioning station of Claim 12 wherein the rotary-to-linear actuator comprises a rack portion that is in meshing engagement with a pinion portion.

14. The cheese block portioning station of Claim 13 wherein the rack portion comprises a characteristic height that corresponds to a desired weight of the cheese column portion.

15. The cheese block portioning station of Claim 13 wherein the rotary-to-linear actuator comprises a jackscrew.

16. A finishing station for use with a food product is provided, the station comprising:

a rotary-to-linear actuator;

a cutting member; and

a platform to receive the food product thereon, the platform connected to the rotary-to-linear actuator and operable to position the food product at a predetermined height relative to the cutting member for portioning the food product at the predetermined height to obtain a food product portion having a desired size.

17. The finishing station of Claim 16 wherein the rotary-to-linear actuator comprises a rack portion that is in meshing engagement with a pinion portion.

18. The finishing station of Claim 17 wherein the rack portion comprises a characteristic height that corresponds to a desired weight of the cheese column portion.

19. The finishing station of Claim 17 wherein the rotary-to-linear actuator comprises a ballscrew or a jackscrew.

20. A method of portioning a column of cheese to obtain a cheese block of a desired size, the method comprising:

providing a cheese block former;

providing a column of cheese within the former;

establishing a predetermined cheese block height corresponding to a desired cheese block size;

programming the block former with cheese block information, the information including the predetermined cheese block height;

sensing, using a linear transducer, a linear displacement of a rotary-to-linear actuator, the linear displacement representative of an actual cheese block height;

generating, via the linear transducer, a feedback signal representative of the actual cheese block height;

transmitting the feedback signal from the linear transducer to a controller;

generating, via the controller, a control signal that is representative of a cheese block height adjustment amount in response to the feedback signal;

transmitting the control signal representative of the height adjustment amount from the controller to a drive in operable association with a motor;

using the control signal to adjust a speed of the motor;

driving the rotary-to-linear actuator using the motor;

moving a platform for supporting the column of cheese to a distance corresponding to the block height adjustment amount using the rotary-to-linear actuator so as to adjust the actual cheese block height to correspond with the predetermined cheese block height; and

cutting the column of cheese at the predetermined cheese block height to obtain the cheese block at the desired size.

21. The method of Claim 20 further comprising: generating a cutting signal when the rack reaches the predetermined height and actuating a cutting blade in response to the cutting signal.

22. The method of Claim 20 further comprising: obtaining, via the linear transducer, a feedback signal and transmitting the feedback signal to a programmable logic controller ("PLC") to control the motor speed

23. The method of Claim 22 wherein the feedback signal of the actuator represents a height measurement of the elevator and the height measurement corresponds to the height of the food portion.

24. A method of portioning food product at a predetermined size, the method comprising:

establishing a predetermined food portion height corresponding to a desired food portion size;

programming requisite food product specifications;

sensing, using a linear transducer, a linear displacement of a rotary to linear actuator, the linear displacement representative of a food portion height;

generating, via the linear transducer, a feedback signal representative of the food portion height;

transmitting the feedback signal from the linear transducer to a controller;

generating, via the controller, a control signal that is representative of a food portion height adjustment amount in response to the feedback signal;

transmitting the control signal from the controller to a drive in operable association with a motor;

using the control signal to adjust a speed of the motor;

driving the rotary to linear actuator with the motor;

using the rotary to linear actuator to adjust the food portion height to correspond with the predetermined food portion height; and

cutting the food product at the predetermined food portion height to obtain the food portion having the desired size.

25. The method of Claim 24 further comprising: generating a cutting signal when the rack reaches the predetermined height actuating a cutting blade in response to the cutting signal.

26. The method of Claim 24 further comprising: obtaining, via the linear transducer, a feedback signal and transmitting the feedback signal to a programmable logic controller ("PLC") to control the motor speed.

27. The method of Claim 26 wherein the feedback signal of the actuator represents a height measurement of the elevator and the height measurement corresponds to the height of the food portion.

28. A food product portioning apparatus comprising:

means for establishing a predetermined food portion height corresponding to a desired food portion size;

means for programming requisite food product specifications;

means for sensing, using a linear transducer, a linear displacement of a rotary to linear actuator, the linear displacement representative of a food portion height;

means for generating, via the linear transducer, a feedback signal representative of the food portion height;

means for transmitting the feedback signal from the linear transducer to a controller;

means for generating, via the controller, a control signal that is representative of a food portion height adjustment amount in response to the feedback signal;

means for transmitting the control signal from the controller to a drive in operable association with a motor;

means for using the control signal to adjust a speed of the motor;

means for driving the rotary to linear actuator with the motor;

means for using the rotary to linear actuator to adjust the food portion height to correspond with the predetermined food portion height; and

means for cutting the food product at the predetermined food portion height to obtain the food portion having the desired size.

29. A food product portioning apparatus comprising:

a rotary-to-linear movement means;

a support means connected to the rotary-to-linear movement means, the support means for receiving a food product thereon, and the support means moveable to position the food product at a predetermined height; and

a cutting means to portion the food product at the predetermined height.